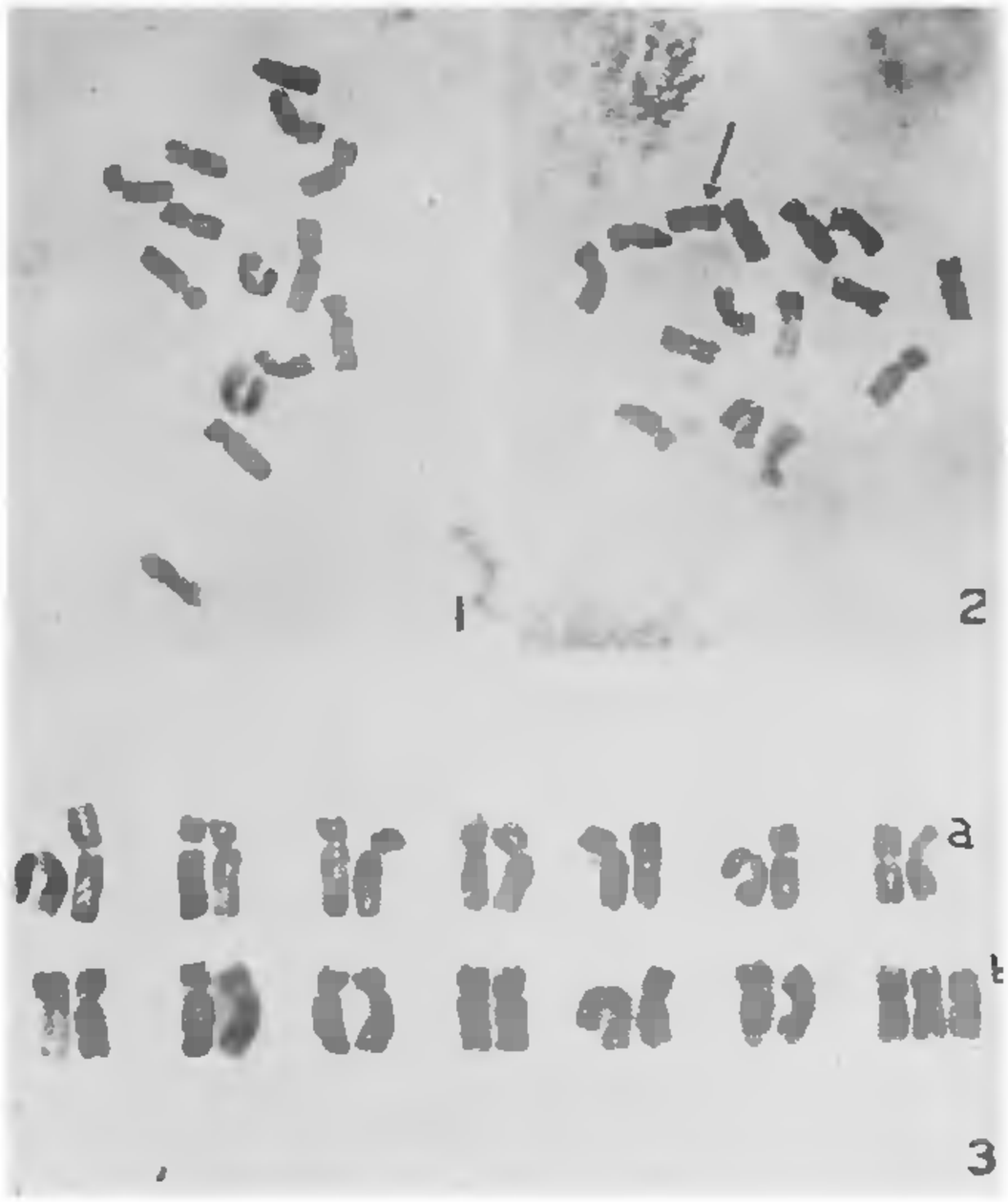

FIGS. 1-3. Figs. 1 and 2. Somatic complement of normal diploid ($2n = 14$) and trisomic ($2n + 1 = 15$). Arrow indicates extra chromosome, × 1,500. Fig. 3. Photo ideogram of diploid (*a*) and trisomic (*b*) × 2,100.

may lead to the supposition that there is a relatively greater tolerance for smaller chromosomes and that they are transmitted more freely than the larger ones as in the case with tomato[4].

Due to the lack of meiotic studies, it is difficult to indicate the nature of trisomy. However, there can be two possibilities. The intraspecific variation in karyotype has been noted by the present authors (unpublished data) and a few cultivars show median (M, '*r*' index 1·0) seventh pair. The extra chromosome found in the present case might have come from $n + 1$ gamete of such a cultivar. The possibility also includes some degree of outcrossing in this habitual inbreeder[1]. The other possibility of extra chromosome, being an isochromosome, can also not be ruled out, as was reported in *Avena*[5] and other genera like *Datura*, *Mathiola* and *Zea*[6].

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1. Darlington, C. D., *Chromosome Botany*, George Allen and Unwin, London, 1973.
2. Levan, A., Fredga, K. and Sandberg, A. A., *Hereditas*, 1964, **52**, 201.
3. Khush, G. S., *Cytogenetics of Aneuploids*, Academic Press, Inc., N.Y. and London, 1973.
4. Rick, C. M. and Barton, D. W., *Genetics*, 1954, **39**, 640.
5. Rajhathy, T. and Fedak, G., *Can. J. Genet. Cytol.*, 1970, **12**, 358.
6. Burnham, C. R., *Discussions in Cytogenetics*, Burgess Pub. Company, Minneapolis, 1962.

COLCHICINE-INDUCED AUTOTETRAPLOIDS OF TEA [*CAMELLIA SINENSIS* (L.) O. KUNTZE]

THE occurrence of natural polyploids in Assam tea with the chromosome number ranging up to the hexaploid level has been reported earlier[1-3]. The triploid Japanese varieties screened out, exhibited thicker leaves, longer and fewer stomata and were more resistant to cold[4]. Out of 292 colchicine treated shoots, only one shoot was recovered as a total tetraploid shoot[5]. It was reported that polyploid plants were self-sterile but gave rise to triploids when pollinated with pollen from diploid plants[6,7] and that the spontaneous polyploids were exclusively triploids[8]. The induction of autotetraploidy in Assam tea by colchicine treatments was successful in our research field.

The results of all the treatments followed in the experiment with three varieties of tea (St. 449, St. 458 and St. 450) were taken separately and they are presented here.

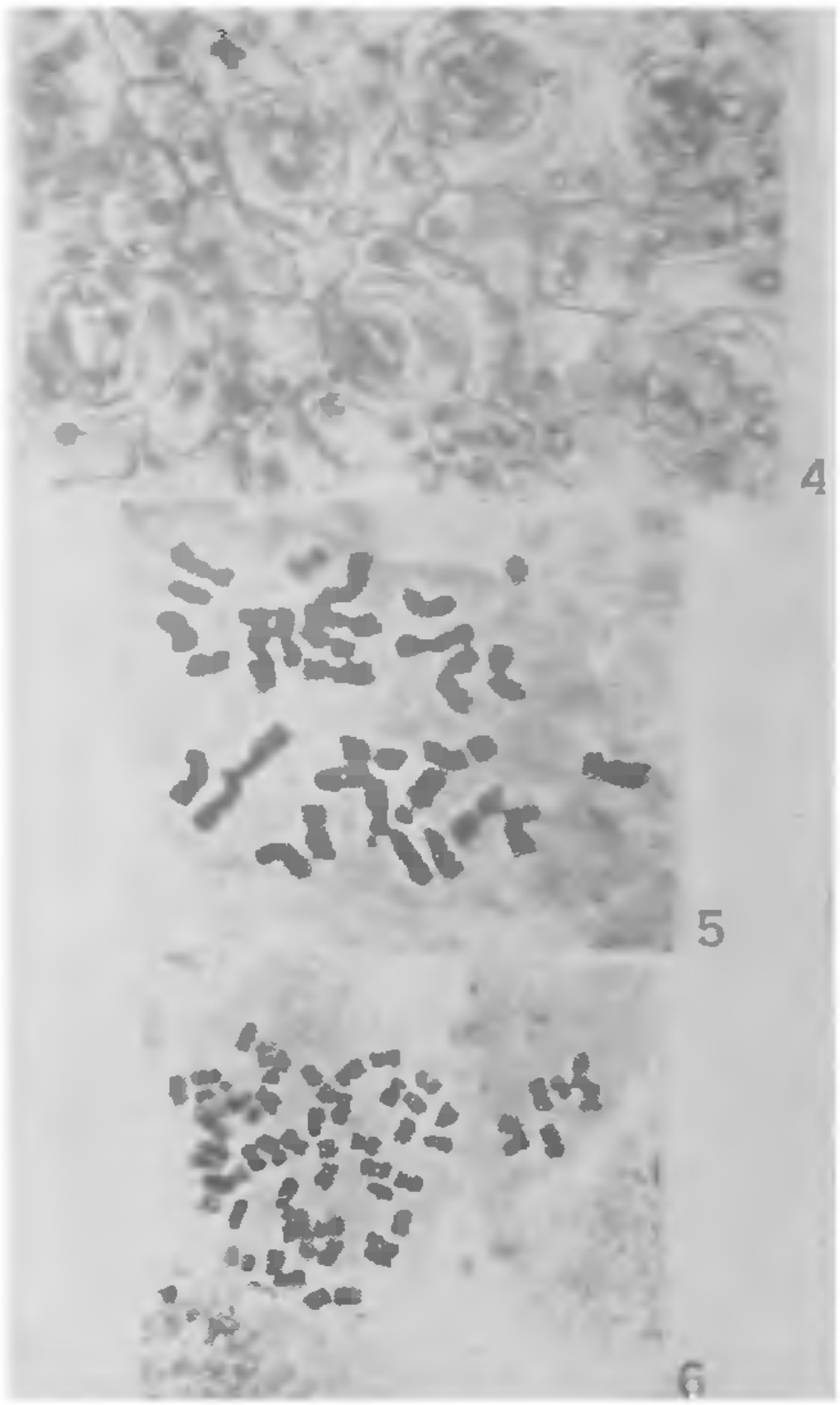
1. *Seed treatment* : The seeds of 3 varieties of tea were treated with aqueous colchicine of concentrations ranging from 0·25 to 0·50% for a duration of 12 to 24 hr but no polyploidy could be induced. Though at the very beginning the seedlings looked healthy, some of the seedlings under different treatments died within one month. The remaining seedlings grew well.

2. *Apical and axillary bud treatment* : Young and active apical and axillary buds were treated with colchicine solutions of 0·25 to 1·0% concentrations for 24 hr and applied for 1-3 days. Cotton plugging method was employed. The survival rate varied from variety to variety. Some of the treated buds of each variety died within one week of treatment; the remaining buds grew well and developed into healthy sheets. None of the treatments was found effective in inducing polyploidy.

3. *Treatment of meristematic region* : As the above three methods failed to induce polyploidy, a

FIGS. 1–3

drastic method was employed. Five terminal buds from each variety were treated with colchicine solution of 0·50 and 1·0% concentrations for 2–5 days. Active terminal buds were carefully scratched with a needle to expose the meristematic tissue on which a small quantity of absorbant cotton was put and



FIGS. 4–6

colchicine solution was poured on it with a dropper. The buds were kept moist throughout the treatment period by dropping colchicine solution at 3 hr intervals and also covering them by polythene bags. The survival rate was very low here in comparison to the previous treatments and this treatment also, in inducing autopolyploidy, proved to be unsuccessful.

4. *Treatment of terminal bud by immersion method* : The failure of all the previous treatments led to this most drastic treatment. Fifteen terminal buds with folded leaves from each variety were kept constantly immersed ih colchicine solution of 0·50 to 2·0% concentrations for a duration of 2–7 days. It was observed that the survival percentage gradually decrease with the increase of concentration and treatment period. However, the treatment was successful in inducing total tetraploidy in all the three varieties of tea (Figs. 1–6). The maximum percentage (20%) of recovery of tetraploid was in the variety, St. 449 under 1·0% colchicine solution treated for a duration of 7 days. The next best recovery (13·3%) was

obtained in the varieties, St 449 and St 458 under 1·0% and 2·0% concentrations treated for 5 days. The lowest recovery (6·6%) was obtained in the variety, St 459 under 1·0% and 2·0% concentrations of colchicine solution treated for 7 and 5 days respectively.

It was stated that induction of polyploidy in tea by colchicine had met with little success. It was further stated that series of unsuccessful experiments with the chemical suggested that the tea plant, like some other woody plants, was not responsive to colchicine[9]. The present investigation, in spite of the low percentage recovery of induced tetraploids, could successfully open a new vista for effective application of the methods used herein.

In the induced tetraploids, the leaves of the shoots are found to be smaller in size with prominent veins, dark green colour, increased thickness and larger stomata with lower frequency in number per unit area in comparison to their diploid counterparts. The chromosome count, made from shoot squash, clearly indicates tetraploid, $2n = 60$ (Fig. 6). The propagation of induced tetraploids by leaf cutting is in progress.

The tetraploid shoot obtained are of considerable genetic importance and further studies on these may contribute valuable information on the origin of tetraploid plant and may help in a better understanding of the cytogenetics of tea.

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1. Bezbaruah, H. P. *Stain Tech.*, 1968*a*, 43, 279.
2. —, *Curr. Sci.*, 1968*b*, 37, 624.
3. —, *Caryologia*, 1971, 24, 421.
4. Simura, T. and Inaba, T., *Tea Research Journal*, 1953, 28, 7.
5. Katsuo, K., *Study of Tea*, 1966, 33, 1.
6. Toyao, T., *Ibid.*, 1960, 22, 6.
7. —, *Tea Research Journal*, 1960, 15, 6.
8. Kapanadze, I. S. and Eliseev, V. A., *Bulletin of the Academy of Science of Georgian SSR*, 1975, 77, 173.
9. Anonymous, *Ann. Rep. Tocklai Experimental Station*, 1968-69, p. 50.

MASS MORTALITY OF *SOLEN TRUNCATUS* (BIVALVIA : SOLENIDAE) IN TUTICORIN BAY, SOUTH INDIA

The razor clam *Solen truncatus* inhabits the sandy marine and brackish water environments. During the periodical faunal survey along the intertidal area of the sea shore of Tuticorin (Lat. 8° 47′ N; Long. 78° 9′ E) on 24th June, 1979, hundreds of just died *S. truncatus* (2·8 to 5·3 cm length; 0·55 to 1·0 cm breadth) which originally inhabit the bottom of the sea were found ploughed from the bottom and thrown upon the beach for about half a kilometer (Fig. 1). A few numbers of *Aplysia* sp. and *Tellina* sp. formed the group victims with *S. truncatus*.

Fig. 1. *Solen truncatus*, washed ashore.

As per the Meteorological Department of Port of New Tuticorin, the early morning of 24th June 1979 had a cyclonic storm with a speed of 103 km/hr (the maximum for the entire month). The water was turbid and the temperature, salinity and dissolved oxygen concentration were 25·0° C, 35·2‰ and 4·0 ml/l respectively.

Sanders[1] reported the large scale mortality of oysters from the inshore beds of St. Louis Bay due to a severe hurricane. James[2] reported that severe storms may cause great injury by covering the benthic fauna with layers of mud or sand or conversely benthic invertebrates are ploughed from the bottom of the sea and thrown upon the beach. Zahuranec[3] noted the mass